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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,061	10/23/2003	Jerome C. Huck	10001487-1	7272

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EXAMINER
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SCHLIE, PAUL W

ART UNIT	PAPER NUMBER
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2186

DATE MAILED: 12/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/692,061	<b>Applicant(s)</b> HUCK, JEROME C.	
	<b>Examiner</b> Paul W. Schlie	<b>Art Unit</b> 2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 October 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date: _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>1</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

### DETAILED ACTION

1. Claims 1-19 have been examined.

#### *Drawings*

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. As figure 4 is inconsistent with the disclosed invention, which should not depict the new hypothetical cache line N resulting data state from the re-compiled optimization being co-resident with the cache line's data state prior to optimization. It is suggested to partition figure 4 into parts A and B, where part A depicts a hypothetical cache state prior to optimization, and part B depicting it's hypothetical resulting state after optimization, corresponding changes should be made as appropriate within the specification. No new matter should be introduced.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheets should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or

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"New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

3. The disclosure is objected to under 37 CFR 1.71, as per the above drawing objection; as reference (on page 13), to a hypothetically resulting cache line N state post optimization, should not be described as being implicitly co-resident with a cache state resulting prior to optimization. The application will be reviewed as if acceptable anticipated corrections are made. The applicant is reminded that no new matter may be introduced which is not supported by the disclosure as originally filed.

***Claim Rejections - 35 USC § 112***

4. Claims 4-19 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure that is not enabling. As critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

As per claims 4-19, although it is understood by one of ordinary skill in the art that temporal and spatial locality of data reference affects cache efficiency and therefore system performance, the method by which a compiler may specifically utilize such statistics to transform an original program into a logically equivalent one with more optimal (by some definitive measure) temporal and/or spatial data access attributes, is not obvious nor likely implemented without undue experimentation by one of ordinary skill in the art; claims dependant on this critical element are not considered enabled.

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Corrective action is required, and the applicant is reminded that no new matter may be introduced which is not already supported by original disclosure.

***Claim Rejections - 35 USC § 102 / 103***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-19 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Chrysos et al. (5,809,450).

As per claims 1, 10, 13 and 18-19, Chrysos et al. teaches an apparatus and corresponding methods utilizing and/or used within the same, comprising: a cache integrated within a data processing system which may be instrumented to record access statistics including access counts associated with individual data accesses on an instance by instance basis, or as an aggregate over a definable period of time or circumstance (thereby rendering an indication and/or counting of data accesses associated with cache lines as being inherent and/or obvious; and although not cited, being inherently required by many cache line replacement policy implementations as the basis of determining a least recently and/or frequently accessed candidate victim

line; where further the addressable resolution of a cache line is not considered as being significant to the claims, as the addressable resolution requirements of a cache are considered as being inherently dictated by a processor's ISA and implementation); where the gathering of dynamic statistics may be assisted by an assisting interrupt driven monitoring program, where then the gathered statistics may be subsequently utilized to improve the monitored/instrumented program's temporal and/or spatial locality of data reference, thereby improve it's otherwise non-optimized cache access efficiency (see figures 1-3, 7, 12-16; column 1 lines 60-67, column 5 lines 57-64, column 6-7 lines 48-2, column 10 lines 14-18, column 11 lines 49-67, column 18 lines 26-29, column 23-24 lines 59-6, column 26 lines 33-67).

As per claims 2-9, 11-12 and 14-17, being dependant on claim 1, 10, 13, or correspondingly dependant claim inclusively, all remaining cited claim limitations are considered as either being inherent in that thought by Chrysos et al. or not considered sufficient to patentably distinguish over prior art.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul W. Schlie whose telephone number is 571-272-6765. The examiner can normally be reached on Mon-Thu 8:00-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Kim can be reached on 517-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**PIERRE BATAILLE**  
**PRIMARY EXAMINER**

12/14/05